

AFIT/GTM/LAL/99S-4

SPACE-AVAILABLE TRANSPORTATION:  
AN ANALYSIS OF THE COST OF  
PROVIDING 'FREE' TRAVEL

THESIS

Frank J. Long, Captain, USAF

AFIT/GTM/LAL/99S-4

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Frank J. Long, B.S.

Captain, USAF

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Now let's play!

Frank J. Long

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### Abstract

The purpose of this study is to estimate the costs borne by the government for providing space-available travel to eligible uniformed services personnel and their dependents. As the primary provider of the space-available privilege, it is important that the Air Force have an estimate of the burden that the administration of that privilege places on the budget.

In January 1993, the Air Force discontinued its 15-year-old practice of charging a fee for space-available travel aboard AMC-owned or controlled aircraft. The fee had been set at \$10 in 1978 and was collected to recover a portion of the costs associated with providing space-available travel. At the time of cancellation, the fee was less than one third of those costs, which were estimated to be approximately \$32.

The cost of space-available travel consists primarily of personnel expense and the cost for the additional aviation fuel required for transportation. Naturally, as salaries and fuel prices continue to rise, so does the cost of space-available transportation. This study estimates the current per-passenger cost to be \$42, and given the volume of space-available traffic this amounts to approximately \$16,000,000 annually. These rising costs may warrant consideration of once again collecting a nominal space-available fee.

SPACE-AVAILABLE TRANSPORTATION:  
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**I. Introduction**

**General Issue**

For many years the Air Force has provided space-available transportation aboard Air Mobility Command (AMC) owned or operated aircraft. Space-available seats are surplus seats offered to active duty members, Armed Forces retirees, and certain qualified dependents of both of these groups after all space-required travelers have been accommodated (15: I-2). Space-available travel is governed by Department of Defense Regulation (DoDR) 4515.13R, the Joint Federal Travel Regulation (JFTR), Volume 1, and Air Mobility Command Instruction (AMCI) 24-101, Volume 14.

DoDR 4515.13R states that the purpose of the space-available program is to offer an avenue of respite from the rigors of Uniformed Services duty (12: 6-1). This regulation further relates that space-available travel is a privilege, not an entitlement. That is, while the benefits of space-available travel are of great value to members of the armed services, nowhere in the governing regulations is this benefit guaranteed to any traveler. Few would argue the reality of pressures caused by geographic separation from families when service members are stationed abroad. Nor is it unreasonable to assess that in many cases, due to financial constraints, space-available travel is a service member's

only viable method of bridging the miles between him or herself and his or her family members.

As the Air Force continues to decrease size of the total force, the inequality between manpower assigned and the number of tasks they are expected to perform has widened. Accordingly, a number of benefits that armed services members have enjoyed in the past have been reduced, offered at an increased monetary fee, or eliminated altogether. Space-available travel; however, is one benefit which has not been reduced. In fact, in 1995 the privilege was extended to command-sponsored dependents of members stationed overseas to allow them to travel even when unaccompanied by their sponsor. Furthermore, over the years, space-available travel has accounted for a growing percentage of the total number of passengers moved aboard AMC owned or controlled aircraft. This trend has resulted in increased workloads at passenger terminals; specifically, non-revenue generating workloads for which costly additional manpower is earned. Although space-available travel offers several benefits to military members and their dependents, an important question to be posed is what costs should be borne by the government for such travel?

Over the years, fees charged to space-available travelers have been extremely low or non-existent. Prior to 1978, space-available travel was provided free of charge. In 1978, upon Congressional urging, a \$10 per passenger fee was instituted and remained in effect until as recently as 1993. The purpose of the \$10 charge was to recover a portion of the expenses incurred for processing and transporting space-available travelers. These expenses include the aerial port staff members, costs associated with the use and maintenance of vehicles and material handling equipment (MHE), as well as the

additional aircraft fuel required when the weight of space-available passengers is considered in the flight plan. On 19 January 1993 the Secretary of Defense ordered that the fee be eliminated and there was a return to the practice of not charging for space-available travel. The primary reason for elimination of the fee at that time was the inconsistency with which the four services were collecting the fee at their terminals around the world. To avoid inequities and any perceived discriminatory collection practices, it was deemed simpler at the time to cease collecting the fee at all terminals rather than attempt to reconcile these inconsistencies.

### **Research Objective**

While there is no arguing that many members and their dependents welcome this travel authorization, it must be said that the increased space-available ridership places additional workload on aerial port personnel. The time may be at hand for consideration of returning to the practice of charging space-available travelers a nominal fee to offset a portion of the costs incurred by this workload. Collection of space-available travel fees should not be intended to completely recoup all related costs, but a reasonable fee would help to place the burden of financing some of this expense directly on those who are using this benefit.

It is important to clarify that the point of this research is not to suggest that the space-available travel benefit is one that should be eliminated. Instead, this paper purposes to identify and present the costs borne by the government for providing space-available travel, and further to evaluate alternatives to allocating and recovering a portion of those costs.

## **Chapter Overview**

Chapter two is a review of the aforementioned DoD IG report, as well as other literature related to the collection of a space-available travel fee. Additionally, information outlining the increased use of space-available travel aboard AMC owned or operated aircraft is presented. Chapter three offers alternative methods of estimating the costs to the Air Force that result from space-available travel aboard these aircraft, as well as requirements to calculate a reasonable space-available travel fee designed to recover some of these costs. Chapter 4 consists of application of recent space-available use, fuel cost, and other current data to the methodologies discussed in Chapter 3. Finally, Chapter 5 provides a conclusion of the data analysis and any possible recommendations for implementation of a space-available fee.

## **II. Literature Review**

### **Overview**

In reality, there is little in the way of literature that deals with the issue of space-available travel. Much of what there is; however, does not reflect positively on either its use or management. Further, the reviews, audits, and demands for corrective action within the space-available travel program have come from sources outside of the Air Mobility Command. The reports and findings from these sources are detailed in the following paragraphs.

### **House Appropriations Committee, 1974**

The earliest in-depth analysis of space-available travel was found in the FY74 House Appropriations Committee Report, number 93-662, which is dated November 26, 1973. In this report the committee indicates that they had previously only been "generally aware" of the increase in the use of space-available travel, but as of the date of the report were becoming increasingly concerned about the perceived manner in which DoD was providing space-available travel (19: 100). Their concern was great enough that in the report they directed the Secretary of Defense to curtail the practice of providing space-available travel to the fullest extent possible. The committee cited the energy crisis as one of the reasons for the curtailment, indicating that scarce fuels were better used for higher priority purposes (19: 99).

In support of their decision, the committee provided some historical data relative to the use of space-available travel. They indicated that in FY66, a total of 153,529 space-available travelers were moved on Military Airlift Command (MAC, which is now

Air Mobility Command) owned or operated aircraft. This included all organic aircraft as well as any commercially chartered aircraft. The committee was further troubled by the fact that in FY72, that number had increased by 119 percent, to a total of 336,229 space-available passengers. It was the committee's belief that abuse of the space-available privilege was responsible for this increase. In addition, the following totals were provided for originating space-available travel aboard MAC international channel routes for the period FY68 – FY72:

Table 1. International Space-Available Passengers (19: 100)

Period	Passengers	Military Aircraft	Commercial Aircraft
FY68 – FY72	1,682,550	734,128	948,422

At the time of the report, most commercial flights were configured to carry approximately 165 passengers, and the committee noted that movement of the 948,422 space-available travelers on these flights would have required 5,748 commercially chartered planes. It was then the opinion of the committee that the space-available privilege had evolved into an informal requirement for MAC to provide on-demand airlift to space-available travelers, entirely at government expense.

The committee was also disturbed that military terminals which operated only cargo missions had been allowed to establish passenger terminals, that Distinguished Visitor (DV) lounges had been created, and that transient quarters and free transportation, both on- and off-base, were also being provided to space-available travelers at government expense (19: 101). The committee stated that these practices were intolerable and were clear indications that the space-available privilege was being abused,

and must therefore be eliminated. To this end, they directed the Secretary of Defense to discontinue providing military aircraft, as well as to cease purchasing excess commercial aircraft, for the purpose of providing space-available travel. All aircraft were to be provided for no purpose other than to provide for the combat readiness of the armed forces. In contradiction to their statements; however, the committee went on to state that members and their dependents traveling on emergency leave were to be allowed to occupy any seats not used for official travel. Further, any remaining excess capacity could be offered to active duty members traveling space-available, but only on a first-come, first-served basis. The committee was reluctant to agree to the practice of allowing retirees to travel at all, and went on to suggest that all space-available travelers not on emergency leave be required to pay a pro-rata share of the cost of obtaining transportation.

In another effort to reduce the perceived abuse of airlift capacity for space-available travel, the Appropriations Committee sought to force each service to gain more control over their respective members. To achieve this goal, the committee reduced the services' FY74 budget requests for second destination travel by a total of \$25,500,000. These reductions, by service, were \$10,000,000 from the Army; \$10,000,000 from the Air Force; and \$5,500,000 from the Navy budget requests (19: 109-123).

#### **General Accounting Office (GAO) Report, 1977**

Although the House Appropriations Committee suggested in their report on the FY74 budget that travelers be required to pay a pro-rata fee for space-available travel, no action was taken to establish the amount of that fee until shortly before the FY78 budget

was passed. At that time, the 95<sup>th</sup> Congress had received a Government Accounting Office (GAO) report, number B-133025, which was the result of an audit ordered by the House Appropriations Committee in 1974. This report showed that efforts to reduce space-available travel had not been successful. Quite to the contrary, as a percentage of all travel aboard MAC owned or operated aircraft, space-available travel had again steadily increased each year. While space-available travelers accounted for 9 percent of total passengers in 1968, that number had nearly tripled, reaching 24 percent in 1975.

Table 2. Space-Available Travel Percentages for FY68 – FY75 (18: 5)

FY	Total Passengers Airlifted	On MAC Controlled Aircraft	On Other Defense Controlled Aircraft	Percent of Total Passengers
1968	2,978,000	278,000	N/A	9
1969	3,256,000	336,000	N/A	9
1970	3,263,000	373,000	N/A	10
1971	2,906,000	360,000	N/A	12
1972	2,243,000	336,000	N/A	15
1973	1,721,000	310,000	N/A	18
1974	1,438,000	286,000	N/A	20
1975	1,883,000	305,000	155,000	24
<b>Total</b>	<b>19,688,000</b>	<b>2,584,000</b>	<b>155,000</b>	<b>Avg: 14</b>

The GAO report did not attempt to establish what, if any, the incremental costs were for processing space-available travelers. Instead, it simply estimated that the average cost to process a space-available traveler was \$17; however, nothing in the report indicates how that number was calculated. Additionally, the Airport and Airway Revenue Act of 1970 directed the Air Force to pay a tax of \$3 for each passenger departing the United States aboard commercial aircraft. Although no longer required, from 1970 until the time of this GAO report in 1977, the Air Force had paid taxes of \$850,000 for such space-available travelers, and no attempt was ever made to have the

space-available travelers reimburse the Air Force for this expense (17: 3). The GAO recommended that the DoD collect the average processing costs and the tax amount from all space-available travelers.

The report addressed the services' concern over increased costs associated with collection of a space-available fee by suggesting the use of the collection system already in place to receive money for in-flight meals. It was noted that collecting, processing, and depositing fees from space-available travelers would result in little or no increase in the workload of terminal personnel. The rationale was that this process was already occurring, it would simply involve larger amounts of cash.

This GAO report was not fully supported by the Assistant Secretary of Defense (Comptroller). The Assistant Secretary did agree that space-available travelers should pay the tax amount, plus a surcharge to cover the collection costs. The Assistant Secretary; however, did not agree that a space-available processing fee should be assessed to travelers. He stated that since military terminals were staffed only according to the workload of space-required passengers, there were no additional costs incurred by the government for processing members traveling on a space-available basis. The Assistant Secretary vowed that DoD would continue to monitor the staffing process to ensure that space-available travelers would not be used to increase manpower authorizations at military terminals. While true at the time, this is no longer the policy used to determine manpower requirements, an issue that will be addressed at a later point in this thesis.

In any case, the GAO questioned this policy and believed that the increased workload associated with processing space-available travelers was quite significant. As

an example, they cited information from a 3-month review of all passenger traffic at Dover Air Force Base, Delaware (18: 3). Dover, a cargo terminal, had 44 passenger processing personnel assigned to operate a passenger terminal 24 hours per day, 7 days a week. During the ninety-day review period, Dover processed 2,659 passengers. Of that number, 1,660 were space-available and 999 were traveling on official duty. If the terminal was manned based solely on the number of space-required travelers, these 44 troops were only responsible for processing 11 official-duty passengers each day.

The GAO did not agree with the 1974 House Appropriations Committee that space-available travel should be eliminated. Rather than curtail this benefit, they recommended a service charge equal to the average processing costs plus any required tax amounts, and suggested this fee be implemented as early as possible.

#### **House Appropriations Committee, 1977**

The House Appropriations committee had, in 1974, requested the aforementioned GAO audit of the space-available travel program. Some of the results of the GAO study were published in the committee's report on the DoD Appropriations Bill, number 95-451, dated June 21, 1977. In their report the committee stated that they were in disagreement with the DoD position that space-available passengers could be processed at no extra charge to the government (22: 174). In support of their argument, the committee again cited the volume of space-available travelers as a percentage of total passenger movement. Using FY75 space-available travel information, the committee estimated that it cost the government \$7,800,000 to process space-available travelers during that year. Based on this volume, as well as other information found in the GAO

report, the committee set out to establish a per-passenger fee for space-available travel. Initially, their intent was to collect the full cost of processing each traveler, which would have set the fee at \$20. After discussion; however, the fee was established at \$10 and the committee directed that all terminals through which a space-available traveler passed would collect this amount. In a move that was not anticipated, the committee estimated that collection of this fee at military terminals would generate revenues of \$3,500,000 in the following year, and the Air Force Operations and Maintenance budget request for FY78 was subsequently reduced by that amount (22: 174). The Senate Appropriations Committee in their report, number 95-325, later approved this budget reduction to the 1978 DoD appropriation bill (24: 174).

#### **Department of Defense Inspector General (DoD/IG) Audit Report, 1991**

Approximately 11 years after the implementation of the \$10 space-available fee, the DoD/IG conducted an audit, number 91-075, to determine if the DoD was actually recovering the costs of processing and transporting space-available passengers aboard DoD owned or controlled aircraft. Additionally, the audit sought to evaluate the adequacy of the internal cash collection and control procedures implemented at collecting terminals. This audit was conducted from December 1989 through June 1990, and evaluated FY88 space-available passenger data. The result of this audit was the disclosure of the fact that not only was the DoD not collecting sufficient costs to recover the expenditures for space-available travel, but also the collection process itself was extremely flawed (14: 5).

In determining the costs to process and transport space-available passengers, the auditors used an average of the costs from 13 terminal locations. The individual costs of terminal operations for each of these terminals were summed and divided by the total number of originating passengers at all locations. The resulting average cost to process an originating passenger using this method was \$24.70, down from a previous DoD/IG estimate of \$26.24 (13: 14). The terminals and costs that were included are listed below.

Table 3. Passenger Processing Costs (14: 19)

Location	Total Originating Passengers	Cost of Terminal Operation	Cost to Process an Originating Passenger
Dover AFB, DE	44,159	1,130,968	25.61
McGuire AFB, NJ	22,536	1,498,012	66.47
Charleston AFB, SC	35,712	1,317,790	36.90
Norton AFB, CA	88,476	1,723,605	19.48
Travis AFB, CA	59,640	1,851,310	31.04
Hickam AFB, HI	78,484	3,306,855	42.13
Andersen AFB, Guam	37,941	794,800	20.95
Rhein Main AB, Germany	207,961	3,463,000	16.65
Philadelphia IAP, PA	89,571	2,425,882	27.08
Charleston IAP, SC	57,564	919,078	15.97
Los Angeles IAP, CA	43,319	883,894	18.29
Oakland IAP, CA	19,689	1,233,751	62.66
Lambert IAP, MO	81,503	981,933	12.05
<b>Total</b>	<b>871,555</b>	<b>\$21,530,868</b>	<b>\$24.70 (Average)</b>

It is important to note that this amount is strictly the cost to *process* space-available passengers and does not include the additional cost associated with *transporting* them. To calculate the transportation costs, the auditors estimated that 11.21 extra gallons of fuel were required for each space-available passenger. This amount, 11.21 gallons, was the requirement for transportation over the average distance of a MAC flight, which the auditors determined to be 1,778 miles. At a per gallon cost of \$.61, the

transportation cost averaged \$6.84 for each space-available traveler, and over the entire year totaled \$5,244,584 (\$6.84 x 766,752) (14: 21). According to these estimates, the total cost to the DoD for each space-available passenger was \$31.54, and the yearly cost to the DoD for the 766,752 space-available passengers during FY88 was \$24,183,358.

Collection of a \$10 fee from each space-available passenger would have generated \$7,667, 520 in revenues; however, the fee was not collected from every passenger. Under the guidelines for implementation of the \$10 fee, only passengers on international flights were required to pay. Additionally, under exemptions prescribed in MAC Regulation 76-1, passengers traveling within CONUS were exempt from the fee, as were passengers that originated through terminals with annual totals of 1000 passengers or fewer. It was MAC's contention that fee collection at these low-volume terminals would result in excessive administrative costs that would offset any benefit of collecting the \$10 fee. As a result of these exemptions, 143,500 passengers were not required to pay the space-available fee during FY88. The remaining 623,300 passengers should have paid, and collection of \$10 from each one would have generated \$6,233,000 in revenues. A review of the funds collected during FY88 revealed that the DoD only collected approximately \$4,600,000. It is noted in the audit report that there is no way of knowing if the remaining \$1,700,000 was never collected or if it was, in fact, collected and never deposited (14: 7). This shortage highlights the second finding of the audit; the inadequacy of the cash collection and control process.

There were several discrepancies noted in the report concerning the collection and control of funds. Most significant was the lack of a method to reconcile the amount of money collected to the number of passengers processed, as recorded on the station

handling reports. There was no formal reconciliation process, or requirement for such a process, by which to ensure that all non-exempt space-available travelers had been charged the \$10 fee. During the audit, an analysis was conducted to compare the amount of funds collected to the number of fee-required passengers processed. The result was that none of the 23 terminals audited were able to account for all of the funds that should have been collected. Discrepancies ranged from \$10 to \$17,760, with an average shortage of approximately \$4,560 (14: 13). In addition to this fact it was also noted that 173 of 429 required deposits were not made within the prescribed time period. Deposits were required daily, but not later than the following day. Deposit records of 25 terminals were reviewed and it was noted that 20 of them had late deposits, ranging from one to 12 days late (14: 15). The absence of any reconciliation system, coupled with loose control procedures, created an atmosphere in which collected money was vulnerable to pilferage, and in which that pilferage was virtually undetectable.

The DoD/IG audit also indicated that funds that were collected were not being deposited into the accounts that had actually funded the costs of providing space-available travel (14: 9). Funds collected were normally reimbursed to the Air Force Operations and Maintenance (O&M) budget account, a process that had been in place since the 1978 decision to implement fee collection. Recall that with that decision the committee had reduced the Air Force O&M budget by \$3,500,000. Logically then, one would assume that any monies collected would be placed in the O&M account to replace that which was reduced under the committee's direction. In reality, space-available travel was funded by two entirely different accounts. The first was the Airlift Service Industrial Fund (ASIF), which has recently been renamed the Transportation Working Capital Fund

(TWCF). This account provided funding for fuel costs, maintenance and utilities at the aerial port terminals, and all contractor support costs. The second fund, the Military Personnel Appropriation Fund (MPAF), was used to pay the salary and benefits for the personnel providing services within the aforementioned functions. By comparison, MPAF funded approximately \$12,600,000 (52%) of the costs associated with space-available travel and ASIF funded the remaining 48 percent, or \$11,600,000. Neither of these accounts was reimbursed for any of the expenses incurred during FY88 or any of the years prior to this audit, so the monies collected did not go to offset the costs of the operations. The result was that for FY88 and FY89 the ASIF account incurred losses of \$89,400,00 and \$14,800,000 respectively (14: 9).

The audit report made several recommendations as a result of their efforts. The first was a request for policy and guidance concerning the fee to be collected from space-available passengers. The request was to the Assistant Secretary of Defense for Production and Logistics, and called for a system that would be reviewed periodically to ensure that it continually recovered all costs associated with space-available travel. These costs were to include all of the processing and transportation costs as outlined previously and clearly would have resulted in a substantial increase to the \$10 fee. This recommendation also stipulated that any space-available fee established be required from all passengers, without exception, traveling aboard DoD owned or controlled aircraft. Further, the audit recommended that MAC establish, track, and report on a system of internal controls for annual reconciliation of all originating space-available travelers, as reported on the terminals' station handling reports, to the cash collected. The auditors cited required compliance with DoD Directive 5010.38, "Internal Management Control

Program," concerning oversight of the process of reconciliation and depositing of all monies collected.

Finally, the audit recommended that all funds collected for space-available travel be deposited to the ASIF and MPAF accounts, with each account receiving a percentage of the revenues approximately equivalent to the percentage of space-available travel that it funded (14: 11).

### **Miscellaneous Correspondence**

Subsequent to the 1991 DoD/IG audit report, AMC and the DoD attempted to reconcile the amount of the space-available fee. HQ MAC did not concur with the findings and recommendations of the DoD/IG audit report. First, MAC did not agree with the cost allocation method used in the audit, stating that only variable costs should be included in the determination of any space-available fee. By doing so, MAC believed that only those expenses that were incurred as a result of processing and transporting space-available passengers would be used to calculate the appropriate fee. Second, MAC believed that any funds collected should continue to be deposited in the ASIF account to help protect the O&M baseline budget, which was reduced in 1978. More importantly, MAC was reluctant to raise the space-available fee at all, citing the fact that the Army, Navy, and Marine Corps were not collecting even the \$10 fee. The DoD/IG recommended the fee be increased to \$32, which was the first increase in 14 years. Although the fee increase had been mediated down to \$15, the Air Force maintained that their image would suffer by charging the new fee.

In addition to the implementation of the collection of the increased fee, the Assistant Secretary of Defense, Communication, Computers and Logistics directed the Army and the Navy to conduct surveys to determine which of their terminals should begin collecting space-available fees. The surveys were intended to identify those terminals at which the fees collected would not exceed the costs associated with collecting, processing, controlling, and depositing them.

HQ AMC and the Assistant Secretary of Defense, Communication, Computers and Logistics could not resolve the issue between their respective offices. Subsequently, a message was dispatched from the AMC/CC, General Johnson, to then Vice Chief of Staff of the Air Force (CSAF/CV), General Carns, requesting that the issue be reopened for negotiation (20: 1). That request was denied, and General Carns directed that the new \$15 fee be collected, beginning 15 June 1992, at all terminals that were currently collecting the \$10 fee (21: 1). In response to this direction, AMC/CC requested that the issue be considered by the Joint Chiefs of Staff, primarily to address the issue of the disparity between collection practices of the various services. After much delay and debate, the matter was settled on 19 January 1993 when the Secretary of Defense cancelled the collection of all space-available fees at all DoD terminals.

### **Summary**

The preceding discussion highlights the fact that management of the space-available program has, in the past, been a contentious issue. The initial concern focused on the amount of space-available travel as a percentage of all travel aboard DoD owned or operated aircraft. It was believed at the time that the increase resulted from an abuse

of the space-available privilege. Additionally, there was debate over the equitable division of responsibility to bear the expenses related to space-available travel. There does not appear to have been complete agreement in either the decision to implement a space-available fee or in the determination of the amount to be charged to each passenger to recoup the costs borne by the DoD. This is indicated by the lengthy delay in the implementation, and subsequent reduction, of the fee once it was directed by the House Appropriations Committee as well as the delay, and ultimate cancellation, of the fee following the submission of the DoD/IG audit report. In the end, rather than endure the tedious task of evaluating, controlling, and monitoring the DoD-wide collection of a fee from space-available travelers aboard all DoD owned or operated aircraft, the decision was made to eliminate the fee altogether.

### **III. Methodology**

#### **Overview**

While the 1993 decision to eliminate all space-available fees certainly avoided the effort required to implement a uniformed, DoD-wide, policy for establishing and collecting the fee, it placed the entire burden of financing space-available travel on the DoD. The inability to reach a consensus on the amount to be charged, as well as the work involved in determining which locations should collect the fee might have made this decision appealing at the time; however, after seven years it may be worthwhile to examine the costs associated with providing free space-available travel to all eligible members. Although the total number of space-available passengers has decreased since the publication of the preceding reports, the volume of space-available travel as a percentage of all travel aboard DoD owned or operated aircraft has significantly increased. It naturally follows that the total costs to the DoD for space-available passenger movement have also gone up, due in part to the inflation of the component costs over time as well as the increased percentage of space-available travel.

Determination of those component costs, as well as an appropriate space-available fee, depends upon the method used to calculate both. In 1991, the DoD/IG suggested using average processing and transportation costs, while the Air Force argued that a marginal or incremental cost method would be more accurate (14: 10). Clearly, the results of any cost analysis using such varied methods will likewise be very different. It is not my intent to estimate and compare the processing and transportation costs for space-available travel using both methods. Instead, shortcomings and advantages of both

methods will be examined, and a determination made as to which method offers the most realistic estimate of space-available costs that the DoD is currently financing.

Additionally, since neither method is best utilized for all of the costs involved, the pros and cons of each costing method will be examined relative to each of the component cost categories.

### **Space-Available Cost Categories**

As previously mentioned, there are several cost factors that should be considered when estimating the total cost that the DoD expends to provide space-available travel. These include maintenance and utilities at the aerial port terminals, fuel costs, contractor support costs, as well as the salaries of the personnel providing services within the aforementioned functions. The personnel costs encompass areas such as passenger service counter workers, baggage handlers, baggage conveyor, staircase truck and bus operators, as well as the personnel responsible to account for and deposit any funds collected. All of the aforementioned costs are tracked by HQ AMC and, with the exception of fuel, are reported collectively as terminal operations costs. For purposes of comparing costing methods, the cost categories will be examined individually.

### **Manpower Authorizations**

The choice of which cost allocation procedure to use may depend largely on how manpower is earned by the aerial port terminals. In the past, these manpower authorizations were earned solely on the space-required passenger volume. As stated in the 1974 House Appropriations Committee report, Congress was emphatic that no additional manning should be authorized for workload incurred as a result of processing

and transporting space-available passengers. Currently; however, aerial ports do in fact earn manpower for space-available passengers. The Air Force Manpower Standard (AFMS) for passenger service personnel determines manning based on the number of originating, terminating, through-load, and rehandled passengers, both space-required and space-available. A monthly average of 5,000 – 6,000 passengers would result in authorizations for 29 manpower positions at the passenger terminal. In some cases there are additional position(s) added to these authorizations as a result of manpower variances. Examples of instances in which variances are allowed are for terminals not located near the flightline and terminals in cold weather areas. At present the AFMS is not in use, rather manning is distributed to each of the terminals according to the passenger workload through the use of a manpower allocation tool developed by AMC. Bases processing more passengers receive a greater number of the authorizations that currently exist. Distribution for the current number of personnel assigned to the passenger service function at the 13 enroute aerial ports and the 5 major CONUS bases is shown in the table below. It does not include the Baltimore/Washington and Los Angeles International Airport operating locations.

Table 4. Passenger Service Personnel (7)

<b>AFSC/Skill Level</b>	<b>Inclusive Ranks</b>	<b>Active Duty</b>	<b>Civilian</b>	<b>Total</b>
2T231	AB – A1C	166	60	226
2T251	SrA – SSgt	227	50	277
2T271	TSgt – MSgt	66	5	71
21T3	2Lt - Capt	11	0	11
		<b>470</b>	<b>115</b>	<b>585</b>

## **Marginal Processing Costs**

Determination of processing costs that can be attributed to the workload imposed by the movement of space-available travelers can be done using either costing method. The practice of distributing personnel authorizations according to terminal workload may make it difficult to establish an incremental cost increase, for each individual base, that would apply equally to all aerial ports regardless of passenger volume and space-available/space-required mix. For example, data from FY's 1997 and 1998 indicates that space-available travelers accounted for 92 percent of all C-5 passengers during each of these years. During this same time period, space-available travelers accounted for 78 percent and 83 percent of all C-141 passengers. Conversely, space-available travelers aboard C-17 aircraft only made up 55 and 56 percent of all passenger traffic in FY's 1997 and 1998, respectively (4: 80). This disparity would make it difficult to establish a DoD-wide space-available fee using marginal, or incremental, processing costs. Use of a marginal cost method to estimate marginal costs incurred for each base would obviously result in significantly different numbers at bases operating different aircraft types. The marginal costs for bases primarily operating C-17 aircraft would be substantially lower than those bases operating C-5's. In the interest of equity and standardization, all bases would be required to assess the same space-available fee. Consequently, marginal processing costs estimated for each base would ultimately have to be averaged across all aerial port terminals to establish a uniform space-available fee at all locations. The result would be that some passengers at some terminals would pay more than the actual per-passenger incremental cost, and passengers at others would be paying less.

During FY's 1997 and 1998, space-available travelers accounted for 54 and 49 percent of all passenger movement aboard AMC owned or operated aircraft, respectively. Accordingly, for FY 1998 use of the AFMS and the manpower allocation tool would then indicate that approximately 49 percent of all personnel authorizations were earned, or retained, as a result of these non-revenue-generating passengers. That implies that the personnel costs for approximately 287 of the present 585 passenger service personnel represent the marginal personnel increase for providing space-available travel. To calculate the cost of that personnel increase, it is necessary to consider the breakdown of assigned passenger service personnel, both by skill level and the percentage of all authorizations that each skill level accounts for. That breakdown is shown in Table 5.

Table 5. Passenger Service Personnel by Skill Level (8)

AFSC/Skill Level	Inclusive Ranks	Total Number Active Duty and Civilian Positions	Percent of All Authorizations
2T231	AB – A1C	226	38.63
2T251	SrA – SSgt	277	47.35
2T271	TSgt – MSgt	71	12.14
21T3	2Lt - Capt	11	1.88
		<b>585</b>	<b>100</b>

All authorizations earned as a result of space-available workload must then be allocated to the various skill level categories and multiplied by an average of the salaries for all ranks within the respective category. Average salaries will include basic pay, Basic Allowance for Housing (BAH), and Basic Allowance for Subsistence (BAS).

Additional considerations are required to arrive at a reasonable average for the different pay grades within each category. Salaries will vary according to whether or not members have dependents, since the 'With Dependents' rate for BAH is greater than the 'Without Dependents' rate. Demographic statistics available through the Air Force Personnel Center provide marital status percentages by grade and career family. The appropriate percentages must be applied to the authorizations in each skill level category that are earned as a result of space-available workload. Further, an estimate must be made of how many of the additional, or marginal, authorizations to apply to each skill level category. Finally, marginal authorizations must be distributed according to the percentage that each category represents of the total number of authorizations. For example, since the 2T231 skill level accounts for 38.63 percent of the total manpower authorizations, the same percentage of the marginal authorizations will be assumed to come from this group. Similar computations will be made for each rank in the group.

It is not unintentional that no mention has been made of the value of those non-monetary benefits that service members also receive. Historically, any specific dollar amount placed on these benefits has been met with much skepticism and debate. Regardless of the costing method used, inclusion of a prescribed amount would increase the processing costs. While it is recognized that these costs do exist, in the interest of conservatism, as well as limiting the number of cost averages, they will not be included.

**Omissions of a Marginal Cost Method.** While it may be argued that using a marginal costing method provides a more accurate representation of the processing cost increases that are directly attributable to space-available passenger traffic, it must also be

stated that this method omits some cost factors. The fact that manpower authorizations are earned equally for space-available and space-required passengers makes it fairly easy to estimate the cost of the marginal authorizations. The same cannot be said for other cost factors, such as maintenance of terminal facilities, building costs, and utilities. Since most of these expenses are required to operate the terminal regardless of the space-available/space-required passenger mix, it is not appropriate to allocate them based on the percentage of that mix. First, it is common sense that terminal facilities are an inevitable cost regardless of the space-available/space-required mix of passenger volume. That is, it is not practical to suggest any significant cost changes for rent or leases if the space-available passenger traffic was increased or decreased, or if space-available travelers were charged a fee. This is also true for costs associated with utilities expenses within the terminals. Similarly, any attempt to allocate maintenance costs for terminal facilities to the volume of passenger traffic, either space-available or space-required, would not yield any useful figures. Given that terminals are required, it stands to reason that these must also be maintained. The question that must be asked is how much terminal space is required?

To say that terminals are required and therefore no cost increases can be attributed to the volume of space-available passengers is to ignore this question. In reality any terminal space, maintenance, utilities or other costs that are greater than the amount necessary to handle the space-required volume are in fact marginally incurred entirely due to the space-available passenger traffic. Recall the ninety day study of the passenger terminal at Dover AFB, Delaware (18: 3). This unit was only processing approximately 11 official duty travelers each day, yet it maintained a passenger terminal and a staff of

44 personnel. It could reasonably be argued that a volume of only 11 passengers each day could be handled in a relatively small facility. Further, any costs greater than those necessary for this number of passengers are entirely marginal, and entirely attributable to the space-available traffic. It is not suggested that bases with low space-required volume be relegated to operating from skeleton terminals. The point to be made is that the decisions to design, build, renovate, and maintain passenger terminals should take into consideration what is actually required for mission accomplishment. Expenses that go beyond those requirements further increase the government's cost of providing space-available travel, with no chance of those expenses being recovered as long as this benefit continues to be offered at no cost to travelers.

The one facet of building maintenance that may be directly impacted by a high percentage of space-available travelers is custodial contracts for routine terminal cleaning. The nature of space-available travel is such that passengers spend more time in the terminal waiting for transportation than duty travelers do. Space-available travelers are generally more willing to accept transportation to more than one destination, and frequently remain in the terminal for longer periods in an effort to get on a flight. Additionally, many space-available travelers remain in the terminal overnight, hoping to avoid excessive billeting costs. As a general rule, space-required passengers are funded for billeting during their temporary duty, so they tend not to remain in the terminal unless they are participating in roll call for a particular flight. For terminals with a high concentration of space-available passenger traffic, more people in the terminal for extended periods may require more frequent custodial services. These potential cost increases are not significant enough to warrant separate cost analysis. Instead, all

facilities, maintenance and utilities costs will be equally allocated over the total number of passengers, space-available and space-required, to arrive at a per-passenger amount of these expenses. As with personnel costs, these are included as part of the terminal operating costs, as reported by AMC/FMB.

### Average Processing Costs

A more straightforward method of estimating the processing costs is to use the annual terminal operating costs. These are the costs to operate all AMC aerial ports and are reported by AMC/FMB. While this amount does not specifically detail how much is allocated to the passenger terminal, as opposed to the freight service or other functions within the aerial port, AMC/FMB representatives use an estimate of 29 percent of the total terminal operation costs for passenger service functions (23). An average processing cost can be obtained by allocating this amount over the total number of all passengers, space-available and space-required. To its advantage, this method provides an average cost that includes those factors that were omitted using the marginal cost method, such as maintenance and utilities. Conversely, it blurs the line separating the marginal costs associated with space-available passenger movement from the unavoidable costs of operating the passenger terminal. In terms of cost per passenger, this method yields a much higher estimate as a result of the allocation of these overhead costs. This difference will be discussed further in the following chapter.

### Transportation Costs

As previously mentioned, the cost of transporting passengers is the amount of fuel required to transport the additional weight of those passengers. During the flight

planning process the only consideration given for weight is the total cargo and passenger weight aboard the aircraft. That is, fuel is not added separately to compensate for the additional weight in the cabin due to the onloading of passengers. For this reason, no formula exists to calculate the amount of extra fuel that is required to move one, or one additional, passenger. The DoD/IG audit conducted in 1991 estimated that 11.21 additional gallons of fuel were required for each passenger, but the report does not indicate how that figure was obtained. Fuel prices for the period of the audit were \$.61 per gallon. Using this fuel price, in combination with the fuel quantity estimate and an average AMC flight of 1,778 miles, it was determined that transportation costs were \$6.84 per passenger.

Because no one formula exists to calculate a per-mile, per-passenger fuel cost, other methods must be employed to establish a reasonable estimate of the amount of fuel that is used for the purpose of transporting passengers. This amount will obviously be the same whether the passengers are space-available or space-required.

Estimating fuel consumption is tricky at best, since several factors influence the amount of fuel burned during a flight. Winds, inclement weather, and altitude are examples of just a few of these unknown, and largely uncontrollable, variables. Obviously, other factors such as the total weight of the payload and the distance traveled are equally important in the determination of fuel consumption.

One method of determining a per-passenger fuel requirement is to use aircraft planning estimates outlined in a variety of Air Force publications. Using these planning factors as a guideline, calculations can be made to establish an estimate of the fuel consumed primarily for the purpose of transporting passengers. For this paper, planning

information from AFPAM 10-1403, Air Mobility Planning Factors, and AFPAM 23-221, Fuels Logistics Planning will be used. These pamphlets provide several key estimates, such as fuel burn rates, aircraft block speeds, and aircraft payloads (11: 70).

In the case of the C-5 aircraft, it is possible to estimate the amount of fuel consumed for the transportation of the passengers by applying the ratio of passenger weight to total payload weight to the percentage of the total fuel burned during flight. This is possible since the planning factors provide an ACL that includes a specific cargo/passenger mix. Specifically, these factors estimate a cargo load of 61.3 short tons of cargo and 51 passengers for a trip that is 3,200 nautical miles in length (10: 13). Using fuel burn rates and aircraft block speeds, total fuel consumption for this trip can be figured. Simply, the trip distance divided by the average block speed gives the flight time required for travel. That time, multiplied by the fuel burn rate, estimates the total gallons of fuel required. Multiplying the average fuel cost per gallon by the total gallons used then estimates the fuel cost for transportation of the cargo and the passengers. Again, this total cost is then multiplied by the percentage of the total payload that represents passenger weight. The result is a total fuel cost for passenger transportation which, when divided by the 51 passengers used in the planning, provides a per-passenger estimate of the fuel cost for this 3,200 nautical mile flight. This is possibly more easily understood as

$$[(Distance \div Block\ speed) \times Burn\ rate] \times Price\ per\ gallon \times \frac{PassengerWeight}{TotalWeight} \div \# Passengers$$

**Limitations.** While the burn rates and block speeds are fairly straightforward, some limitations must be noted regarding aircraft payloads as they will apply to this paper. Planning factors for cargo and passenger weights are exclusive of one another. That is, a separate Allowable Cabin Load (ACL) is calculated to indicate the maximum weight of cargo or the maximum number of passengers that each aircraft type can transport. Obviously, maximizing the cargo weight or volume leaves either no room or ACL for passengers, and vice versa. No separate planning factors are outlined for any specific cargo/passenger mix for any aircraft types other than the C-5. The reason for this is simply that the C-5 passenger compartment is above the cargo bay, allowing for the transportation of up to 73 passengers providing that the passenger weight and the cargo payload does not exceed the ACL.

Information from AMCR 55-4, C-141B Configuration/Mission Planning will be used to estimate fuel costs for a C-141 passenger/cargo load. A similar cargo/passenger mix could be developed, through trial and error, for other aircraft types, but these would be hypothetical and may not represent feasible, or practical, load configurations. For these reasons, the C-5 and C-141 planning factors are used for fuel cost estimates and assumed to be representative of the overall costs.

### **Average Flight Distance**

The most direct method of obtaining an estimate of the average flight distance is through use of information compiled by HQ AMC throughout the year and published in the AMC Command Data Book. Particularly, the total number of passenger miles and the total number of originating passengers are useful for estimating average flight

lengths. Dividing the total passenger miles traveled by the number of originating passengers will provide a reasonable estimate of the average distance that each originating passenger travels. This figure is then used in combination with per-gallon fuel prices to estimate the cost of fuel consumed for transportation.

### **Summary**

The purpose of determining the cost of space-available travel is quite simple, that is to allow decision-makers to make informed, intelligent fiscal decisions related to the administration of this benefit. The costs associated with providing space-available transportation on DoD-owned or controlled aircraft are clearly dependent upon the method by which those costs are estimated. While there may be any number of methods and variations available, it is believed that those outlined in this chapter will provide a reasonable estimate of the costs considered.

## **IV. Data Analysis**

### **Overview**

This chapter contains an application of recent historical data to the methods of determining the cost of space-available travel as outlined in Chapter 3. An important note that should be made at this point is the fact that the cost of space-available travel may very well change from year to year. This is true primarily because the cost factors that are involved, particularly fuel prices, manpower costs, and building and maintenance expenses, are subject to annual changes and inflation. Use of data from any given year is not indicative of the exact costs of space-available travel for subsequent or preceding years. The costs are not significantly different; however, and do offer a reasonable estimate of funds being expended by the DoD for the purpose of providing space-available travel to eligible members.

### **Processing Costs**

Recall that annual terminal operating costs include maintenance and utilities at the aerial port terminals, contractor support costs and the salaries of all personnel assigned to the various functions within the aerial port. While these costs are reported in aggregate for accounting purposes, it is commonly accepted that approximately 29 percent of this total is allocated to operation of the passenger terminal. In FY 1997 the terminal operating costs were \$172,078,000, with \$49,902,620 ( $\$172,078,000 \times .29$ ) of that amount representing the cost of the passenger service function. In FY 1998, those numbers were \$156,651,000 and \$45,428,790, respectively (23). These figures include costs for all TWCF-funded terminals, but do not include Andrews AFB, MD and Scott

AFB, IL, both of which operate using O&M funds. Accordingly, calculations of processing costs do not include passengers originating at these stations.

**Marginal Processing Costs.** The primary marginal cost increase that requires attention is that of the additional personnel authorizations that result from space-available passenger movement. In fact, since no attempt will be made to allocate a portion of the overhead costs to the volume of space-available traffic, this will be the sole marginal processing cost considered here. The first step in determining the marginal expense for processing space-available passengers is to identify the number of authorizations that were earned or retained for their movement. The following table indicates the number of originating passengers, space-available and space required, for FY's 1997 and 1998.

Table 6. FY 1997 and FY 1998 Originating Passengers (4: 80)

FY97	Space Required	Space Available	Total	% Space Available
Commercial	269,578	151,574	421,152	36
C-141	22,068	76,757	98,825	78
C-5	7,113	85,369	92,482	92
C-130	30,643	21,875	52,518	42
KC-10	895	18,837	19,732	95
KC-135	1,178	17,620	18,798	94
C-17	2,321	2,782	5,103	55
Others	21,437	35,162	56,599	62
<b>Total</b>	<b>355,233</b>	<b>409,976</b>	<b>765,209</b>	<b>54</b>
<hr/>				
FY98				
Commercial	293,418	128,049	421,467	21
C-141	11,814	58,864	70,678	83
C-5	5,611	64,038	69,649	92
C-130	25,317	21,566	46,883	46
KC-10	689	15,787	16,476	96
KC-135	446	13,494	13,940	97
C-17	3,090	3,871	6,961	56
Others	18,298	33,215	51,513	64
<b>Total</b>	<b>358,683</b>	<b>338,884</b>	<b>697,567</b>	<b>49</b>

Since manpower is earned equally for space-available and space-required passengers, these data indicate that during FY 1997 approximately 54 percent of manpower authorizations were earned or retained as a result of space-available traffic. Similarly, in FY 1998 that number was 49 percent. Using the 585 manpower authorizations, those percentages equate to 316 and 287 marginal positions for FY's 1997 and 1998, respectively. Estimating the marginal cost of these positions is done using the rank and skill level percentages of the total personnel count and allocating the marginal positions relative to their percentage of that total. By doing so, a more accurate representation can be made of the costs that will be incurred as a result of these marginal authorizations. The allocation of these positions is outlined in Table 7 below.

Table 7. Marginal Manpower Authorizations by Skill Level

Skill Level/ Inclusive Ranks	Authorizations	Percent of All Authorizations	Marginal FY97	Authorizations FY98
2T231/AB – A1C	226	38.63	122	111
2T251/SrA – SSgt	277	47.35	150	136
2T271/TSgt – MSgt	71	12.14	38	35
21T3/ 2Lt - Capt	11	1.88	6	5
	<b>585</b>	<b>100</b>	<b>316</b>	<b>287</b>

While these figures represent the total number of marginal authorizations by skill level, they must also be separated into each pay grade using personnel statistics for all 2T2X0 positions. This is done to more accurately depict the salary expenses for each year, since the percentage in each pay grade varies from year to year due to promotions, separations, and new enlistees. Accordingly, any estimate of the costs of providing

space-available transportation must take into account these constantly changing personnel costs from one year to the next. For FY's 1997 and 1998, the percentages are shown below in Table 8.

Table 8. Marginal Manpower Authorizations by Grade

Skill Level/ Inclusive Ranks	Percent of FY97 Skill Level Authorizations	Percent of FY98 Skill Level Authorizations	Marginal Authorizations	
			FY97	FY98
2T231/AB-AMN A1C	36.8	43.3	45	48
	63.2	56.7	77	63
2T251/SrA SSgt	52.5	51.9	79	71
	47.5	48.1	71	65
2T271/TSgt MSgt	60.4	62.2	15	22
	39.6	37.8	23	13
21T3/ 2Lt 1Lt Capt	22.3	19.0	1	1
	23.9	26.7	2	1
	53.8	54.3	3	3
			316	287

Because military pay raises take effect on 1 January of any year in which there is a raise, the personnel costs for the fiscal year must include pay data from the last three months of one calendar year and the first nine months of the following calendar year. Basic pay and allowance charts for calendar years 1996 and 1997 were used to arrive at personnel costs for FY 97, and charts for calendar years 1997 and 1998 were used for FY 98 personnel costs. In addition, salary for members of the same rank can vary depending on whether or not they receive BAS, full BAH, partial BAH, or no BAH at all. The following table represents the fiscal year salaries for enlisted grades E1 through E7 and officer grades O1 through O3 for FY's 1997 and 1998. Determination of the number of years of service for each pay grade was done in accordance with the years used by the Congressional Budget Office in calculating the pay gap between civilian and military pay

(9: 2). The fiscal year pay is found in Table 9, while the separate pay and allowance amounts used to arrive at these totals are included in Appendix A.

Table 9. 1997 and 1998 Fiscal Year Pay

		FY 97 Pay			FY 98 Pay		
Grade	Base Pay BAS/Full BAH	Base Pay/BAS Partial BAH	Base Pay/No BAH or BAS	Grade	Base Pay BAS/Full BAH	Base Pay/BAS Partial BAH	Base Pay/No BAH or BAS
E1	17,689.88	15,802.58	10,732.50	E1	18,172.91	16,224.41	11,037.60
E2	18,990.38	17,395.58	12,033.00	E2	19,510.31	17,862.41	12,375.00
E3	20,361.98	19,173.08	13,187.70	E3	20,919.71	19,693.01	13,562.10
E4	23,491.28	22,031.48	15,982.20	E4	24,140.81	22,635.11	16,436.70
E5	27,030.08	25,349.78	18,794.70	E5	27,784.01	26,049.71	19,329.30
E6	31,341.98	29,365.58	22,482.90	E6	32,221.01	30,179.81	23,122.80
E7	36,017.48	33,973.58	26,649.90	E7	37,033.31	34,923.71	27,409.50
O1	29,054.25	27,523.35	21,396.60	O1	30,347.88	28,767.48	22,006.80
O2	39,419.55	38,002.05	31,070.70	O2	41,010.18	39,544.98	31,954.50
O3	47,094.75	45,891.45	37,631.70	O3	48,908.58	47,667.48	38,704.50

The final consideration then becomes what percentage of salaries in each grade level should be estimated to have been paid the full BHA rate, a partial BAH, or no BAH at all. A query was run through the Air Force Personnel Center's Interactive Demographics Analysis System (IDEAS) for FY 97 and FY 98 appropriate demographic statistics. Although some members who are not married may in fact have dependents, use of marital status provides a simple yet reasonable set of criteria to determine whether a troop has dependents, and thus receives BAS and BAH at the full rate. The query was run for all 2T2X1, Air Transportation personnel to determine what percentage of members in each pay grade was married. The following table displays the IDEAS results for FY's 1997 and 1998.

Table 10. Marginal Authorizations at Full BAH Rate (1)

Skill Level/ Inclusive Ranks	Marginal Authorizations		Percent Married		Marginal Authorizations At Full BAH Rate	
	FY97	FY98	FY97	FY98	FY97	FY98
2T231/AMN A1C	45 77	48 63	18.6 40.6	20.4 37.3	8 31	10 23
2T251/SrA SSgt	79 71	71 65	63 80.7	63.6 81	50 57	45 53
2T271/TSgt MSgt	15 23	22 13	83.9 85.3	84.9 89.9	13 20	19 12
21T3/ 2Lt 1Lt Capt	1 2 3	1 1 3	42.7 58.3 75.9	40.5 56.7 75.5	0 1 2	0 1 2
					182	165

Given that junior enlisted troops who are not married tend to reside in the dormitories, pay was calculated for all single AB/AMN and A1C members at the basic pay rate with no BAH or BAS included. Additionally, one half of the non-married SrA positions were calculated at the partial BAH rate while the remainder was calculated excluding any BAH. For other grades, salaries for single personnel were calculated to include BAS and partial BAH. The resulting marginal personnel costs for FY 1997 were \$6,986,821.96 and for FY 1998 the total was \$6,465,733.81. A chart that depicts the pay for the marginal positions, by grade and fiscal year, is found in Appendix B.

In FY 97 there were 409,076 space-available passengers, and as a result the processing cost per passenger in FY 97 was  $\frac{\$6,986,821.96}{409,976} = \$17.04$ . During FY 98, terminals processed 338,884 space-available passengers, so processing costs for FY 98 were  $\frac{\$6,465,733.81}{338,884} = \$19.08$  per space-available passenger.

**Average Processing Costs.** Using an average, or pro-rata, cost method introduces the questionable allocation of a portion of the terminal overhead costs to each passenger. This ignores the fact that much of that expense is unavoidable, and the subsequent estimates are not indicative of the actual costs incurred as a result of providing space-available travel. Although an average cost method is easier to use, the advantage of using marginal figures to estimate processing costs is clearly demonstrated when these figures are compared with the estimates that result from using an average cost method. Recall that in FY 97 and FY 98 the terminal operation costs were \$49,902,620 and \$45,428,790, respectively. When allocated for all space-available and space-required passengers, the processing cost is reported to be significantly higher at  $\frac{\$49,902,620}{765,209} = \$65.21$  per passenger in FY 97, as well as  $\frac{\$45,428,790}{697,567} = \$65.12$  per passenger in FY 98.

### **Transportation Costs**

Transportation costs are primarily dependent upon two factors; the average per-gallon price for fuel and the average distance traveled by space-available passengers onboard an AMC-owned or controlled aircraft. Fuel costs were \$.7857 per gallon in FY 97 and \$.9293 in FY 98 (16). To estimate the average number of miles flown by a space-available passenger, the total number of passenger miles are divided by the number of passengers. For FY 97, those numbers are as follows:  $\frac{1,180,600,000}{765,209} = 1,543$  miles per passenger. Additionally, in FY 98 the total miles and number of passengers was  $\frac{1,301,300,000}{697,567} = 1,865$  miles per passenger (4: 78).

To estimate a per-passenger fuel cost, the following formula was used:

$$[(Distance \div Block\ speed) \times Burn\ rate] \times Price\ per\ gallon \times \frac{Passenger\ Weight}{Total\ Weight} \div \# \text{ of Passengers}$$

As discussed in Chapter 3, the C-5 aircraft was used for this estimate due to the planning factors that allow for a cargo/passenger mix. Using these planning factors, the formula is then  $[(1,543 \div 443) \times 3,500/\text{gph}] \times \$0.7857 \times \frac{12,750}{135,350} \div 51 = \$17.69$  per-passenger in fuel costs. Further, using the FY 98 fuel price and flight distance the per passenger fuel cost for FY 98 is estimated at

$$[(1,865 \div 443) \times 3,500/\text{gph}] \times \$0.9293 \times \frac{12,750}{135,350} \div 51 = \$25.29.$$

To estimate C-141 fuel costs, a CP-1 (Cargo/Passenger) aircraft configuration is used. This configuration allows for installation of 51 aft-facing seats and 7 pallet positions for cargo (2: 33). Generally, only 47 seats are offered for passengers, so this number is used here. Further, maximum payload weight used is 68,725 pounds, to include passenger and cargo weight. At 11,750 pounds for passengers ( $250 \times 47$ ), the cargo weight is estimated at  $68,725 - 11,750$ , or 56,975 pounds.

Using these estimates, and the fuel price and flight distance for FY 97, the cost for fuel is  $[(1,543 \div 426) \times 2,075/\text{gph}] \times \$0.7857 \times \frac{11,750}{68,725} \div 47 = \$21.48$  per passenger. For FY 98, costs per passenger are

$$[(1,865 \div 426) \times 2,075/\text{gph}] \times \$0.9293 \times \frac{11,750}{68,725} \div 47 = \$30.71.$$

Finally, fuel costs per passenger are estimated to be the average of the prices determined for both aircraft types. Accordingly, for FY 97, the cost is  $(\$17.69 + \$21.48) \div 2$ , or \$19.59 per passenger and the cost, per passenger, for FY 98 is  $(\$25.29 + \$30.71) \div 2$ , or \$28.00.

The C-5 and the C-141 were used because planning factors allowed a realistic passenger/cargo mix, and it is noted that during FY 1997 and FY 1998 nearly 54 percent of space-available passengers that were moved on organic aircraft were moved on these two aircraft types.

#### **Total Cost per Space-Available Passenger**

If, as proposed, the expenses incurred by the DoD for space-available passenger movement is made up of processing and transportation costs, then the per-passenger cost is determined simply by summing the cost figures calculated in this chapter. The result is an estimate of \$41.86 that the DoD is funding for each space-available passenger that travels on AMC-owned or operated aircraft. Again, it is noted that this cost can vary from year to year as the component costs fluctuate due to inflation, cost of living raises, and other factors. The per-passenger costs for FY's 1997 and 1998 are presented below in Table 11.

Table 11. Space-Available Cost per Passenger

Fiscal Year	Processing Cost	Transportation Cost	Total Cost
1997	17.04	19.59	36.63
1998	19.08	28.00	47.08
Average	18.06	23.80	41.86

The annual cost to the DoD for all space-available passenger movement per year is then the costs shown above multiplied by the total number of originating space-available passengers. When the per-passenger cost is considered alone, it may appear to be low enough that implementation of a space-available fee is not worth the effort to establish and control the process. When the cost for moving several hundred thousand space-available passengers is considered, this should seem less palatable. These costs are shown for FY's 1997 and 1998 in the table below.

Table 12. Annual Costs for All Space-Available Passenger Movement

Fiscal Year	Cost per Passenger	Space-available Passengers	Total Cost
1997	36.63	409,976	15,017,420.88
1998	47.08	338,884	15,954,658.72
<b>Total</b>			<b>30,972,079.60</b>

## Summary

There was never a doubt that providing space-available transportation to eligible members and their dependents results in some expense to the government. Previous reports and audits estimated these expenses as a pro-rata, or average per-passenger cost. The average per-passenger cost for processing is presented; however, it is primarily included to show the contrast to the estimate that results from a marginal cost perspective. Not surprisingly, the marginal cost is significantly lower than the average cost, and offers a more realistic estimate of the true cost for space-available travel.

The per-passenger fuel cost presented is significantly higher than that of the DoD/IG audit. This is partly due to the increase in fuel prices, which were approximately

50 percent higher in FY 98 than in FY 89, as well as a higher estimate of the amount of fuel required. These differences, along with a discussion of other information, will be addressed further in the following chapter.

## **V. Conclusions and Recommendations**

### **Overview**

The purpose of this chapter is to discuss the conclusions drawn from the analysis of the cost of providing space-available transportation. Additionally, recommendations for consideration of implementing a space-available fee will be presented. Finally, limitations of the research conducted are introduced along with suggestions for future research efforts related to the administration of the space-available program.

### **Conclusions**

While space-available travel is offered free to eligible members and their dependents, it is clear to see that this benefit is not free to the government. Although it is virtually impossible to know exactly what it costs to provide space-available travel, it is incumbent on the DoD to, at the very least, estimate what those costs are. The purpose of this research effort was to apply reasonable cost-estimating methods to recent space-available travel data to provide an approximation of the government's financial burden for offering space-available travel. As shown in Chapter 4, the resulting estimate is nearly \$16,000,000 per year.

This yearly cost, although not significant in comparison to the overall TWCF budget, does in fact represent approximately 33 percent of the passenger terminal operation budget. This is a substantial amount of money that is being diverted from other uses. In an era of shrinking budgets and fiscal conservatism, it seems only practical to monitor, control, and adjust expenditures to best utilize the funds that are available. This

should be true for programs that account for relatively small portions of the budget as well as the larger, more visible expenditures.

The per-passenger cost of \$41.86 is only slightly higher than the 1991 DoD/IG estimate of \$32.00, and the difference is attributable to both the processing and transportation components of the total cost. The DoD/IG estimate for processing was \$24.70, based on an average cost method. The estimate developed in this thesis is only \$18.06, and was determined using a marginal cost method. As previously mentioned, there are advantages and disadvantages to both methods, although a marginal cost perspective appears to present a more accurate estimate of the true costs involved.

The bigger disparity comes when comparing the estimates for the transportation component, specifically fuel costs, of this study and the DoD/IG audit of 1991. While the audit estimated this expense at \$6.84, use of the planning factors discussed in Chapter 4 resulted in an estimate of \$21.47 for FY 97 and \$28.00 for FY 98. Higher per-gallon fuel prices account for some of this difference; however, the estimate for the amount of fuel required is approximately two times the 11.21 gallons suggested by the DoD/IG audit. Still, the total fuel costs are extremely insignificant when one considers that in FY 98 AMC spent \$692,296,093 for aviation fuel (5: 3).

Simply using a marginal cost method instead of averaging costs does not ensure that an estimate will indicate the actual costs incurred. Processing costs were determined using the aggregate space-available passenger volume for all reporting stations. An analysis of each individual passenger terminal may result in cost estimates that are significantly different than \$41.86. Stations with a greater percentage of space-available passengers may have costs that are much higher than this amount, while stations

processing mostly space-required passengers will appear to have lower costs. It may very well be that some terminal operations consist primarily of marginal costs incurred as a result of space-available travel. Whether such terminals can be scaled back so as to reduce overhead costs is an issue outside the scope of this thesis, but one which may be worth consideration.

Any decision to implement a space-available fee is certain to be unpopular with the members who take advantage of the space-available program. That displeasure notwithstanding, all of the information presented indicates that this program is expensive to administer. It does not seem unreasonable to charge a nominal fee to recoup a portion of the funds expended to offer this privilege.

In the past there was concern over the inequity of having the Air Force collect a fee at its terminals while other services did not. This was cited as one of the reasons that the Air Force was reluctant to raise the fee subsequent to the DoD/IG audit report's recommendation (20: 1). Additionally, there was never full agreement over which terminals should collect any applicable fees. When the original \$10 fee was implemented, it was Congress' intent that every terminal through which a space-available traveler passed would collect the \$10 fee, regardless which military service operated that terminal (22: 174). In practice, passengers were only charged at the terminal in which their travel originated. This is a more reasonable approach, given that the bulk of the processing is done at origination, with less work required for throughload and terminating passengers.

The debate over how much of the costs should be recovered through collection of a space-available fee is not likely to be settled unanimously. There has been a growing

concern over the perceived erosion of benefits provided to military members and the importance of the space-available benefit to troop morale cannot be ignored. Neither; however, should it be used as the sole justification to continue offering this benefit for free as the costs increase year after year. Surely, for some military members a fee designed to recover all of the marginal expenses would make travel cost-prohibitive and effectively deny them the use of the space-available privilege. For this reason, it may be more appropriate to establish the amount of the fee so as to recoup a portion of the marginal costs while keeping the space-available benefit accessible.

Procedures for collecting, depositing, and accounting for any fees implemented must also be established. As mentioned earlier, most terminals already have such a system in place for collection of the cost of in-flight meals. While increasing the amount of money handled might well present security issues, it should not create an excessive amount of additional work. Certainly, the potential for any additional workload imposed by collection of a space-available fee should not be used to justify the decision to not implement that fee. It hardly stands to reason that space-available passengers are charged for an in-flight meal that cost approximately \$3 while the processing and transportation costs, which are several times that amount, are borne by the government.

### **Recommendations**

DoD should consider implementation of a nominal fee for space-available travel. The decision to establish a space-available fee is not a simple one. Aside from the morale issue, there are other factors that must be considered. The amount of the fee, which terminals and which services should collect the fee, and to which accounts any

collected funds should be reimbursed are just a few. As space-available travel continues to grow as a percentage of all passenger movement, addressing these issues seems a practical and fiscally responsible endeavor.

Clearly, any funds collected through implementation of a space-available fee would represent only a small percentage of the annual terminal operating costs. Over time; however, this would amount to a sizeable sum. For example, if a \$20.00 fee had been charged during FY's 1997 and 1998, AMC would have collected \$14,977,200 to offset the costs incurred for providing space-available travel. This figure represents approximately all of the money spent on marginal manpower authorizations that were earned for the space-available passenger volume during this time period. If AMC can recover all of its marginal costs for manpower and still offer service members air transportation for only \$20, it appears to be a situation in which both parties win.

Customer service and satisfaction are considered an integral part of the passenger service operation. For many military members, the service they get while traveling space-available forms the basis of their impression of AMC, and often the entire Air Force. To suggest a reduction in that service would be contrary to the inroads that AMC has made in this area. Without sacrificing customer service, it may be appropriate to examine the costs of those passenger terminals that serve primarily space-available passengers. Because these terminals will have a significant marginal cost, they may be attractive targets for initiatives to reduce overhead costs. As long as the Air Force flies airplanes, there will be excess seating on many flights and offering them to eligible service members on a space-available basis makes sense. Some additional costs will

naturally be incurred, but it is important that these costs be controlled and minimized wherever practical.

### **Limitations**

Some of the cost estimates are presented with the understanding that there may be additional factors that would alter the results of the analyses that produced them. For instance, fuel costs were estimated using only two aircraft, the C-5 and the C-141. Inclusion of the other types of organic aircraft, as well as the commercial planes used for DoD passenger movement, may result in significantly higher costs, lower costs, or costs that are approximately equal to those presented. The C-5 and the C-141 were used because planning factors allowed a realistic passenger/cargo mix, and it is noted that during FY 1997 and FY 1998 nearly 54 percent of space-available passengers that were moved on organic aircraft were moved on these two aircraft types.

The cost figures presented are also shown in aggregate, as opposed to being shown for individual bases. It has already been mentioned that this may exaggerate the per-passenger costs for bases that process mostly space-required passengers. In addition, per-passenger costs for terminals with workloads that consist primarily of space-available travelers are going to be grossly underestimated. More noteworthy is the fact that marginal overhead costs, which are ignored in the estimation of the processing costs, will vary between bases based on space-available/space-required passenger mix. Space-available passenger percentages on the C-5, KC-10, and KC-135 are 92-97 percent, and the space-available passenger percentage for the C-141 is approximately 80 percent. It is

clear that those terminals operating these aircraft are going to have marginal costs that are much higher than the \$41.86 presented here.

### **Future Research**

Any decision to change the administration of the space-available program will require study in other areas. Certainly, it must be decided which terminals should collect any required fee. This would involve terminal operations run by each branch of service, and must take into account the feasibility of collection based on the passenger volume. In the past, terminals with relatively few passengers deemed the cost of handling the funds to be more than the benefit gained from collecting them, so guidelines for determining a break-even point would be required at each passenger processing location.

Although statistics are available to indicate how many originating space-available passengers traveled on AMC-owned or controlled aircraft, it is not possible to determine how many different military members are using this benefit. That is, some passengers may travel and be counted more than once, such as on an outbound and a return flight. Though it has absolutely no bearing on the costs to the government for providing space-available travel, the value of the space-available privilege is obviously greater to someone who uses it more often than to an individual who does not use it much, or at all.

Determining the value that members place on the space-available privilege should be considered when deciding whether or not to implement a fee for its use. Any fee for space-available travel is going to perpetuate the belief that even more of the benefits of military service are eroding, but the degree to which that perception exists is largely

dependent on the worth of the benefit. It may be true that travelers would consider the space-available privilege to be worth the price of whatever reasonable fee is charged.

## Appendix A. Fiscal Year Pay Calculations

### CY 96 pay

<u>Grade</u>	<u>Base Pay</u>	<u>Full BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 3</u>	<u>BAH x 3</u>	<u>BAS x 92</u>	<u>Total (Oct - Dec)</u>
E1	874.80	345.60	7.15	2,624.40	1,036.8	657.80	4,319.00
E2	980.70	345.60	7.15	2,942.10	1,036.8	657.80	4,636.70
E3	1,074.90	363.00	7.15	3,224.70	1,089	657.80	4,971.50
E4	1,302.60	390.00	7.15	3,907.80	1,170	657.80	5,735.60
E5	1,531.80	448.50	7.15	4,595.40	1,345.5	657.80	6,598.70
E6	1,832.40	498.90	7.15	5,497.20	1,496.7	657.80	7,651.70
E7	2,172.00	539.70	7.15	6,516.00	1,619.1	657.80	8,792.90
O1	1,743.90	468.90	149.67	5,231.70	1,406.7	449.01	7,087.41
O2	2,532.30	524.70	149.67	7,596.90	1,574.1	449.01	9,620.01
O3	3,066.90	614.40	149.67	9,200.70	1,843.2	449.01	11,492.91
<u>Grade</u>	<u>Base Pay</u>	<u>Partial BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 3</u>	<u>BAH x 3</u>	<u>BAS x 92</u>	<u>Total</u>
E1	874.80	193.50	7.15	2,624.40	580.50	657.80	3,862.70
E2	980.70	217.20	7.15	2,942.10	651.60	657.80	4,251.50
E3	1,074.90	267.30	7.15	3,224.70	801.90	657.80	4,684.40
E4	1,302.60	272.40	7.15	3,907.80	817.20	657.80	5,382.80
E5	1,531.80	313.20	7.15	4,595.40	939.60	657.80	6,192.80
E6	1,832.40	339.60	7.15	5,497.20	1,018.80	657.80	7,173.80
E7	2,172.00	375.00	7.15	6,516.00	1,125.00	657.80	8,298.80
O1	1,743.90	345.60	149.67	5,231.70	1,036.80	449.01	6,717.51
O2	2,532.30	410.40	149.67	7,596.90	1,231.20	449.01	9,277.11
O3	3,066.90	517.50	149.67	9,200.70	1,552.50	449.01	11,202.21

### CY 97 pay

<u>Grade</u>	<u>Base</u>	<u>Full BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 9</u>	<u>BAH x 9</u>	<u>BAS x 273</u>	<u>Total (Jan - Sep)</u>
E1	900.90	361.50	7.36	8,108.10	3,253.50	2,009.28	13,370.88
E2	1,010.10	361.50	7.36	9,090.90	3,253.50	2,009.28	14,353.68
E3	1,107.00	379.80	7.36	9,963.00	3,418.20	2,009.28	15,390.48
E4	1,341.60	408.00	7.36	12,074.40	3,672.00	2,009.28	17,755.68
E5	1,577.70	469.20	7.36	14,199.30	4,222.80	2,009.28	20,431.38
E6	1,887.30	521.70	7.36	16,985.70	4,695.30	2,009.28	23,690.28
E7	2,237.10	564.60	7.36	20,133.90	5,081.40	2,009.28	27,224.58
O1	1,796.10	490.50	154.16	16,164.90	4,414.50	1,387.44	21,966.84
O2	2,608.20	548.70	154.16	23,473.80	4,938.30	1,387.44	29,799.54
O3	3,159.00	642.60	154.16	28,431.00	5,783.40	1,387.44	35,601.84
<u>Grade</u>	<u>Base</u>	<u>Partial BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 9</u>	<u>BAH x 9</u>	<u>BAS x 273</u>	<u>Total</u>
E1	900.90	202.50	7.36	8,108.10	1,822.50	2,009.28	11,939.88
E2	1,010.10	227.10	7.36	9,090.90	2,043.90	2,009.28	13,144.08
E3	1,107.00	279.60	7.36	9,963.00	2,516.40	2,009.28	14,488.68
E4	1,341.60	285.00	7.36	12,074.40	2,565.00	2,009.28	16,648.68
E5	1,577.70	327.60	7.36	14,199.30	2,948.40	2,009.28	19,156.98
E6	1,887.30	355.20	7.36	16,985.70	3,196.80	2,009.28	22,191.78
E7	2,237.10	392.40	7.36	20,133.90	3,531.60	2,009.28	25,674.78
O1	1,796.10	361.50	154.16	16,164.90	3,253.50	1,387.44	20,805.84
O2	2,608.20	429.30	154.16	23,473.80	3,863.70	1,387.44	28,724.94
O3	3,159.00	541.20	154.16	28,431.00	4,870.80	1,387.44	34,689.24

**CY 97 pay**

<u>Grade</u>	<u>Base Pay</u>	<u>Full BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 3</u>	<u>BAH x 3</u>	<u>BAS x 92</u>	<u>Total (Oct - Dec)</u>
E1	900.90	361.50	7.36	2,702.70	1,084.5	677.12	4,464.32
E2	1,010.10	361.50	7.36	3,030.30	1,084.5	677.12	4,791.92
E3	1,107.00	379.80	7.36	3,321.00	1,139.4	677.12	5,137.52
E4	1,341.60	408.00	7.36	4,024.80	1,224	677.12	5,925.92
E5	1,577.70	469.20	7.36	4,733.10	1,407.6	677.12	6,817.82
E6	1,887.30	521.70	7.36	5,661.90	1,565.1	677.12	7,904.12
E7	2,237.10	564.60	7.36	6,711.30	1,693.8	677.12	9,082.22
O1	1,796.10	490.50	154.16	5,388.30	1,471.5	462.48	7,322.28
O2	2,608.20	548.70	154.16	7,824.60	1,646.1	462.48	9,933.18
O3	3,159.00	642.60	154.16	9,477.00	1,927.8	462.48	11,867.28
<u>Grade</u>	<u>Base Pay</u>	<u>Partial BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 3</u>	<u>BAH x 3</u>	<u>BAS x 92</u>	<u>Total (Oct - Dec)</u>
E1	900.90	202.50	7.36	2,702.70	607.50	677.12	3,987.32
E2	1,010.10	227.10	7.36	3,030.30	681.30	677.12	4,388.72
E3	1,107.00	279.60	7.36	3,321.00	838.80	677.12	4,836.92
E4	1,341.60	285.00	7.36	4,024.80	855.00	677.12	5,556.92
E5	1,577.70	327.60	7.36	4,733.10	982.80	677.12	6,393.02
E6	1,887.30	355.20	7.36	5,661.90	1,065.60	677.12	7,404.62
E7	2,237.10	392.40	7.36	6,711.30	1,177.20	677.12	8,565.62
O1	1,796.10	361.50	154.16	5,388.30	1,084.50	462.48	6,935.28
O2	2,608.20	429.30	154.16	7,824.60	1,287.90	462.48	9,574.98
O3	3,159.00	541.20	154.16	9,477.00	1,623.60	462.48	11,563.08

**CY 98 pay**

<u>Grade</u>	<u>Base</u>	<u>Full BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 9</u>	<u>BAH x 9</u>	<u>BAS x 273</u>	<u>Total (Jan - Sep)</u>
E1	926.10	371.70	7.43	8,334.90	3,345.30	2,028.39	13,708.59
E2	1,038.30	371.70	7.43	9,344.70	3,345.30	2,028.39	14,718.39
E3	1,137.90	390.30	7.43	10,241.10	3,512.70	2,028.39	15,782.19
E4	1,379.10	419.40	7.43	12,411.90	3,774.60	2,028.39	18,214.89
E5	1,621.80	482.40	7.43	14,596.20	4,341.60	2,028.39	20,966.19
E6	1,940.10	536.40	7.43	17,460.90	4,827.60	2,028.39	24,316.89
E7	2,299.80	580.50	7.43	20,698.20	5,224.50	2,028.39	27,951.09
O1	1,846.50	504.30	155.70	16,618.50	4,538.70	1,868.40	23,025.60
O2	2,681.10	564.30	155.70	24,129.90	5,078.70	1,868.40	31,077.00
O3	3,247.50	660.60	155.70	29,227.50	5,945.40	1,868.40	37,041.30
<u>Grade</u>	<u>Base</u>	<u>Partial BAH</u>	<u>BAS (per day/mo)</u>	<u>Base Pay x 9</u>	<u>BAH x 9</u>	<u>BAS x 273</u>	<u>Total (Jan - Sep)</u>
E1	926.10	208.20	7.43	8,334.90	1,873.80	2,028.39	12,237.09
E2	1,038.30	233.40	7.43	9,344.70	2,100.60	2,028.39	13,473.69
E3	1,137.90	287.40	7.43	10,241.10	2,586.60	2,028.39	14,856.09
E4	1,379.10	293.10	7.43	12,411.90	2,637.90	2,028.39	17,078.19
E5	1,621.80	336.90	7.43	14,596.20	3,032.10	2,028.39	19,656.69
E6	1,940.10	365.10	7.43	17,460.90	3,285.90	2,028.39	22,775.19
E7	2,299.80	403.50	7.43	20,698.20	3,631.50	2,028.39	26,358.09
O1	1,846.50	371.70	155.70	16,618.50	3,345.30	1,868.40	21,832.20
O2	2,681.10	441.30	155.70	24,129.90	3,971.70	1,868.40	29,970.00
O3	3,247.50	556.50	155.70	29,227.50	5,008.50	1,868.40	36,104.40

<u>Grade</u>	<u>FY 97 Pay</u>			<u>FY 98 Pay</u>		
	<u>Base Pay/BAS and Full BAH</u>	<u>Base Pay/BAS Partial BAH</u>	<u>Base Pay and No BAH or BAS</u>	<u>Base Pay/BAS and Full BAH</u>	<u>Base Pay/BAS Partial BAH</u>	<u>Base Pay and No BAH or BAS</u>
E1	17,689.88	15,802.58	10,732.50	18,172.91	16,224.41	11,037.60
E2	18,990.38	17,395.58	12,033.00	19,510.31	17,862.41	12,375.00
E3	20,361.98	19,173.08	13,187.70	20,919.71	19,693.01	13,562.10
E4	23,491.28	22,031.48	15,982.20	24,140.81	22,635.11	16,436.70
E5	27,030.08	25,349.78	18,794.70	27,784.01	26,049.71	19,329.30
E6	31,341.98	29,365.58	22,482.90	32,221.01	30,179.81	23,122.80
E7	36,017.48	33,973.58	26,649.90	37,033.31	34,923.71	27,409.50
O1	29,054.25	27,523.35	21,396.60	30,347.88	28,767.48	22,006.80
O2	39,419.55	38,002.05	31,070.70	41,010.18	39,544.98	31,954.50
O3	47,094.75	45,891.45	37,631.70	48,908.58	47,667.48	38,704.50

## Appendix B. Marginal Personnel Cost Calculations

							<u>FY 1997</u>		
	<u>E1/2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>E6</u>	<u>E7</u>	<u>O1</u>	<u>O2</u>	<u>O3</u>
<b>Basic Pay/BAS/</b>									
<b>Grade</b>	<b>Full BAH</b>								
E1	17,689.88								
E2	18,990.38	8							151,923.04
E3	20,361.98		31						631,221.38
E4	23,491.28			50					1,174,564.00
E5	27,030.08				57				1,540,714.56
E6	31,341.98					13			407,445.74
E7	36,017.48						20		720,349.60
O1	29,054.25								
O2	39,419.55							1	39,419.55
O3	47,094.75								<u>2</u>
									<u>94,189.50</u>
									<b>4,759,827.37</b>
<b>Basic Pay/BAS/</b>									
<b>Grade</b>	<b>Partial BAH</b>								
E1	15,802.58								
E2	17,395.58								
E3	19,173.08								
E4	22,031.48		14						308,440.72
E5	25,349.78			14					354,896.92
E6	29,365.58				2				58,731.16
E7	33,973.58					3			101,920.74
O1	27,523.35						1		27,523.35
O2	38,002.05							1	38,002.05
O3	45,891.45								<u>1</u>
									<u>45,891.45</u>
									<b>935,406.39</b>
<b>Grade</b>									
	<b>Basic Pay Only</b>								
E1	10,732.50								
E2	12,033.00	37							445,221.00
E3	13,187.70		46						606,634.20
E4	15,982.20			15					<u>239,733.00</u>
E5	18,794.70								<u>1,291,588.20</u>
E6	22,482.90								
E7	26,649.90								
O1	21,396.60								
O2	31,070.70								
O3	37,631.70								
<b>Total marginal personnel costs for FY 97:</b>									<b>\$6,986,821.96</b>

								<u>FY 1998</u>	
	<u>E1/2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>E6</u>	<u>E7</u>	<u>O1</u>	<u>O2</u>	<u>O3</u>
<b>Basic Pay/BAS/</b>									
<b><u>Grade</u></b>	<b><u>Full BAH</u></b>								
E1	18,172.91								
E2	19,510.31	10							195,103.10
E3	20,919.71		23						481,153.33
E4	24,140.81			45					1,086,336.45
E5	27,784.01				53				1,472,552.53
E6	32,221.01					19			612,199.19
E7	37,033.31						12		444,399.72
O1	30,347.88								
O2	41,010.18							1	41,010.18
O3	48,908.58								2 <u>97,817.16</u>
									<b>4,430,571.66</b>
<b>Basic Pay/BAS/</b>									
<b><u>Grade</u></b>	<b><u>Partial BAH</u></b>								
E1	16,224.41								
E2	17,862.41								
E3	19,693.01								
E4	22,635.11	13							294,256.43
E5	26,049.71		12						312,596.52
E6	30,179.81			3					90,539.43
E7	34,923.71				1				34,923.71
O1	28,767.48					1			28,767.48
O2	39,544.98								0.00
O3	47,667.48						1		<u>47,667.48</u>
									<b>808,751.05</b>
<b><u>Grade</u></b>	<b><u>Basic Pay Only</u></b>								
E1	11,037.60								
E2	12,375.00	38							470,250.00
E3	13,562.10		40						542,484.00
E4	16,436.70			13					<u>213,677.10</u>
E5	19,329.30								<u>1,226,411.10</u>
E6	23,122.80								
E7	27,409.50								
O1	22,006.80								
O2	31,954.50								
O3	38,704.50								

Total marginal personnel costs for FY 98: **\$6,465,733.81**

## Bibliography

1. Air Force Personnel Center. Interactive Demographics Analysis System (IDEAS II). Software program, n. pag. [http://www.afpc.randolph.af.mil/sasdemog/ideas\\_pre\\_sel](http://www.afpc.randolph.af.mil/sasdemog/ideas_pre_sel)
2. Air Mobility Command. C-141B Configuration/Mission Planning. AMCR 55-4. HQ AMC, 15 June 1992.
3. Air Mobility Command. Command Data Book. HQ AMC Quality and Management Innovation Flight: May 1997.
4. Air Mobility Command. Command Data Book. HQ AMC Quality and Management Innovation Flight: October 1998.
5. Air Mobility Command. Fuel Conservation. AMCP 11-3X. HQ AMC, 1 July 1999.
6. Air Mobility Command. Military Airlift – Passenger Service. AMCI 24-101, Volume 14. Washington: HQ AMC, 1 January 1996.
7. Burrill, Angela MSgt. NCOIC, Manpower and Resources, HQ AMC/DOZM. Telephone interview. 14 April 1999.
8. Burrill, Angela MSgt. NCOIC, Manpower and Resources, HQ AMC/DOZM. Telephone interview. 16 April 1999.
9. Congressional Budget Office. What Does the Military “Pay Gap” Mean? Washington: GPO, 1999.
10. Department of the Air Force. Air Mobility Planning Factors. AFPAM 10-403. Washington: HQ USAF, 1 March 1998.
11. Department of the Air Force. Fuels Logistics Planning. AFPAM 23-221. Washington: HQ USAF, 1 May 1998.
12. Department of Defense. Air Transportation Eligibility. DoD Regulation 4515.13-R. Washington: GPO, 1994.
13. Department of Defense, Inspector General. Report on the Survey of Military Airlift Command Air Passenger Terminals. Report Number 90-046. Washington: GPO, 1990.
14. Department of Defense, Inspector General. Space Available Passenger Fees. Audit Report Number 91-075. Washington: GPO, 1991.

15. Department of Defense. Joint Federal Travel Regulation, Volume 1. Washington: GPO, 1994.
16. DeStigter, Paul MSgt. AVPOL. Excerpt from unpublished report, n. pag. <http://www.amcfm.scott.af.mil/files/twcfcourse>. 15 May 1999.
17. General Accounting Office. Airport and Airway Trust Fund: Effects of the Trust Fund Taxes' Lapsing on FAA's Budget. Report Number RCED-96-130. Washington: GPO, 1996.
18. General Accounting Office. Report Number B-133025. Washington: GPO, 1977.
19. House Committee on Appropriations. Report on Department of Defense Appropriation Bill, 1974. Report 93-662, 93<sup>rd</sup> Congress, 1<sup>st</sup> Session, 1973. Washington: GPO, 1973.
20. HQ AMC. "Increase in Space-Available Passenger Fee." Electronic Message. 231308Z, 01 July 1992.
21. HQ USAF. "Increase in Space-Available Passenger Fee." Electronic Message. 312359Z, 31 July 1992.
22. House Committee on Appropriations. Report on Department of Defense Appropriation Bill, 1978. Report 95-451, 95th Congress, 1<sup>st</sup> Session, 1977. Washington: GPO, 1977.
23. Purtee, Charlene Capt. Chief, Passenger Commercial Services, HQ AMC/DONP. Telephone interview. 16 June 1999.
24. Senate Committee on Appropriations. Report on Department of Defense Appropriation Bill, 1978. Report 95-325, 95th Congress, 1<sup>st</sup> Session, 1977. Washington: GPO, 1977.

## Vita

Capt Frank J. Long was born on 9 February 1962 in Harbor City, California. He graduated from El Dorado High School in 1980 and enlisted in the United States Marine Corps. Over the next 8 years was assigned duties as a Military Policeman and later as a Criminal Investigator at Marine Corps Base, Camp Lejeune, NC, the 3<sup>rd</sup> Marine Division, Okinawa, Japan, and the 1<sup>st</sup> Marine Air Wing, Tustin, CA. Then- Staff Sergeant Long was honorably discharged from the Marines in April 1988 and began attending East Carolina University in Greenville, NC. He graduated with a Bachelor of Science degree in Criminal Justice in December 1992 and subsequently entered Officer Training School in August 1994. He received his commission on 18 November 1994.

Captain Long's first assignment was with the 15<sup>th</sup> Transportation Squadron at Hickam AFB, HI. He transferred to HQ PACAF/LGTR in May 1995 and worked for one year as the Command Transportation Resources Officer. In May 1996 Captain Long moved to the 635<sup>th</sup> Air Mobility Support Squadron where he served as the Chief, Air Terminal Operations Center and later as the Chief, Passenger Service. In May 1998, he entered the School of Logistics and Acquisition Management, Air Force Institute of Technology. Upon graduation, he will be assigned to Headquarters, Air Force Materiel Command.

Permanent Address: 2441 AJ Drive  
Eagle Pass, TX 78852

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
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6. AUTHOR(S)	Frank J. Long, Captain, USAF		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	Air Force Institute of Technology 2950 P Street WPAFB OH 45433-7765		8. PERFORMING ORGANIZATION REPORT NUMBER
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<b>13. ABSTRACT (Maximum 200 words)</b> <p>The purpose of this study is to estimate the costs borne by the government for providing space-available travel to eligible uniformed services personnel and their dependents. As the primary provider of the space-available privilege, it is important that the Air Force have an estimate of the burden that the administration of that privilege places on the budget. In January 1993, the Air Force discontinued its 15-year-old practice of charging a fee for space-available travel aboard AMC-owned or controlled aircraft. The fee had been set at \$10 in 1978 and was collected to recover a portion of the costs associated with providing space-available travel. At the time of cancellation, the fee was less than one third of those costs, which were estimated to be approximately \$32. The cost of space-available travel consists primarily of personnel expenses and the cost for the additional aviation fuel required for transportation. Naturally, as salaries and fuel prices continue to rise, so does the cost of space-available transportation. This study estimates the current per-passenger cost to be \$42, and given the volume of space-available traffic this amounts to approximately \$16,000,000 annually. These rising costs may warrant consideration of once again collecting a nominal space-available fee.</p>			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
Space-Available, Passengers, Passenger Movement, Air Transportation, Space-Required, Planning Factors		64	
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